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GEOGRAPHY AND TRAVELS.¹

PROCEEDINGS OF THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION.—The fifty-first meeting of the British Association for the Advancement of Science, held at York from the 31st of August to the 7th of September, was chiefly occupied in reviewing the progress of science in the various departments during the fifty years of the society's existence. The address of the president of the geographical section, Sir J. D. Hooker was devoted to the growth of our knowledge of the Geographical Distribution of Organic Beings. He briefly alluded to the unprecedentedly great advance made in the last fifty years in our knowledge of the unknown regions of the earth.

"The veil has been withdrawn from the sources of the Nile and the lake systems of Central Africa have been approximately localized and outlined. Australia, never previously traversed, has been crossed and recrossed in various directions. New Guinea has had its coasts surveyed, and its previously utterly unknown interior has been here and there visited. The topography of Western China and Central Asia, which had been sealed books since the days of Marco Polo, has been explored in many quarters. The elevations of the highest mountains of both hemispheres have been accurately determined, and themselves ascended to heights never before attained; and the upper regions of the air have been ballooned to the extreme limits beyond which the life-sustaining organs of the human frame can no longer perform their functions. In hydrography the depths of the great oceans have been sounded, their shores mapped, and their physical and natural history explored from the equator to beyond both polar circles. In the Arctic regions the highest hitherto attained latitudes have been reached; Greenland has been proved to be an island; and an archipelago has been discovered nearer to the Pole than any other land. In the Antarctic regions a new continent has been added to our maps, crowned with one of the loftiest known volcanoes, and the Antarctic Ocean has been twice traversed to the 79th parallel. Nor have some of the negative results of modern exploration been less important for the Mountains of the Moon and many lesser chains have been expunged from our maps, and there are no longer believers in the inland sea of Australia or in the open ocean of the Arctic pole."

A paper was read by Sir Richard Temple, On the Progress of our geographical knowledge of Asia during the last fifty years. "The area of Asia contains seventeen millions of English square miles. Out of this about two-thirds consists of mountains and table-lands whereof a large part is desert; and one-third of lowlands, wherein a small part is desert; the rest of the lowlands being arable, of which again a considerable portion is cultivated. Thus out of the whole area not more than one-sixth is under

¹ Edited by ELLIS H. YARNALL, Philadelphia.

cultivation; among the populated tracts, however, some are the most densely peopled in the world."

"In the midst of the continent is a great central plateau, more than two millions of English square miles in area, rising to great altitudes, which dominates the river systems and the drainage of the greater part of Asia and which is bounded by the Himalayas towards the Indian Ocean, by the Yun-ling and the Inshan Mountains towards the Pacific Ocean, by the Altai and Yablonoi ranges towards the Arctic Ocean, and by the Pamir Mountains towards the inland seas, the Aral and the Caspian. The Pamir Mountains constitute a group connecting the great ranges of Himalaya and Altai. Branching off from this central plateau is another extensive plateau with an average altitude of 5000 feet above the sea, which includes Afghanistan, Beluchistan, Persia, Armenia, and Asia Minor, and from a small part of which the drainage is towards the Atlantic Ocean through the Black Sea and the Mediterranean. It is through Asia Minor and the Caucasus that the Asiatic Mountains are connected with the ranges of southern Europe. It is remarkable that from within this central plateau, walled round as it is by mountain ranges, there rise most of the greatest Asiatic rivers which burst through the mountains in order to make a passage towards the sea. Such, for instance, are the Indus with its affluent the Satlej, the Brahmaputra, the Ganges, the Irawady, the Salwen, the Cambodia or Mekong, flowing into the Indian Ocean; the Yang-tsze Kiang, the Hoang-Ho, the Amur, flowing into the Pacific Ocean; the Lena, the Yenisei, and the Ob flowing into the Arctic Ocean; the Jaxartes and the Oxus flowing into the inland sea of Aral. Many other rivers which though lesser are still very great, take their sources from the outer slopes of the mountains which surround the central plateau.

Next after the oceanic drainage, the inland Asiatic drainage, which finds no vent towards the ocean, may claim attention as being the largest in the world, and as occupying nearly four millions of English square miles or nearly one-fourth of the Asiatic continent. This extraordinary drainage area may be divided into the following categories:—1st, the Caspian; 2d, the Aral; 3d, the Balkash [Siberian]; 4th, Lake Lob [Yarkand]; 5th, Koko-Nor; 6th, the lesser lake of Tibet; 7th, the lesser lakes of Altai; 8th, the Helmand draining nearly all Afghanistan into the Seistan swamps; 9th, the Kavir or saline deserts in Eastern Persia; 10th, the lake of Urumiya in Northwestern Persia; 11th, Lake Van in Kurdistan; 12th, the Dead Sea.

The central plateau is made up of several plateaux having different altitudes. The highest is that of Tibet, on the average 15,000 feet above the sea, the loftiest in the world; next, that of Pamir, 13,000 feet; then that of Koko-Nor, 10,000 feet. Next we see a sudden dip or depression, namely, that of Yarkand or

Western Gobi, only 3000 feet above the sea; then there follow two steps upwards, namely, that of Eastern Gobi, 4000 feet; and lastly that of Altai, 5000 feet.

The central plateau has been the home of most of the nomad and pastoral tribes which have successfully overrun the rest of Asia. It now belongs [with the exception of one tract] to the Chinese empire.

Dividing the continent into eight political divisions Sir Richard Temple gives a condensed, but satisfactory review of the work accomplished in them since 1830, and mention is made of all the principal explorers and writers. In conclusion he says, "The greater part of Asia has not yet been touched by scientific operations on a complete scale. In the whole of Asia only India, Ceylon, Cyprus, Western Palestine, Caucasia, the Caspian basin, part of Western Siberia, and part of Japan, also many points in the Asiatic coastline, have been subjected to trigonometrical observation. The altitudes of mountains have been determined only in the Himalayas, the Caucasus and the Urals by trigonometry. But in many ranges the heights have been approximately ascertained by the barometer. Professional surveys in detail have been completed only in India, Ceylon, Western Palestine, Caucasia, parts of Western and Eastern Siberia, the Tian-Shan region, the greater part of Western Turkistan, Cambodia, parts of Cochin China, parts of Afghanistan, also on certain lines of Persia, Mesopotamia, and Asia Minor.

Even in the professionally surveyed territories many defects and imperfections are acknowledged to remain. Non-professional surveys have been carried out in Japan, in China proper, in parts of Arabia, on the frontiers of Tibet, China, and Burma, and on certain lines in Afghanistan and Beluchistan."

"Of geological surveys, the largest example is that in India which, though far advanced, is far from complete. Very much remains to be done in this respect for the Himalayas. Geological surveys have been made in the Caucasus, the Urals, the Tian-Shan and Altai ranges, Kamchatka, many parts of China and Japan, Cambodia, Ceylon, some parts of Arabia and Persia, much of Asia Minor and Palestine. But there remain unexplored, parts of the Himalayas, of Afghanistan and Beluchistan, of Arabia, nearly the whole Kuen-Lun region north of Tibet in the very heart of Asia.

Further the following are among the principal geographical problems still awaiting solution:—The connection of the Tibetan San-po with the Indian Brahmaputra; the existence of mountains connecting the Kuen-Lun range eastwards with the Chinese ranges; the sources and upper courses of the Irawady, Salwen, Mekong and Hoang-Ho, the disposition of the mountains between the Ladakh passes and the Hindu-Kush or Indian Caucasus north of Caubul, near to the culminating region of the entire continent."

Papers were read as follows: The equipment of exploring expeditions now and fifty years ago, by Francis Galton, F. R. S.; On the survey of Western Palestine, by the Palestine Exploration Fund, by Trelawny Saunders; A review of Oceanic or Maritime discovery, exploration and research, during the half-century, 1831-81, by Captain Sir Frederick Evans, R. N., F. R. S., Hydrographer of the Admiralty.

HUDSON'S BAY.—Dr. Robert Bell, Assistant Director of the Geological Survey of Canada, recently read before the Royal Geographical Society a paper on the Commercial Importance of Hudson's Bay. He gave an interesting account of that great North American sea. "In the popular mind Hudson's Bay is apt to be associated with the polar regions, yet no part of it comes within the Arctic circle, and the southern extremity is south of the latitude of London. Few people have any adequate conception of the extent of this great American sea. Including its southern prolongation, James' Bay, it measures about 1000 miles in length and it is more than 600 miles in width at its northern part. Its total area is approximately 500,000 square miles, or upwards of half that of the Mediterranean Sea of the old world. It is enclosed by the land on all sides except the northeast, where it communicates by several channels with the outer ocean. The principal or best known of these is Hudson's Strait, which is about 500 miles in length, and has an average width of about 100 miles.

"Hudson's Bay, which might have been more appropriately called Hudson's Sea, is the central basin of the drainage of North America. The limits of this basin extend to the centre of the Labrador peninsula, or some 500 miles inland on the east side and to the Rocky Mountains, or a distance of 1300 miles on the west. The Winnipeg Basin constitutes a sort of outlier of the region more immediately under notice, since the waters drain into it from north, south, east and west, and discharge themselves by one great trunk—the Nelson river—into Hudson's Bay. The southernmost portion of this basin, namely, the source of the Red River, extends down nearly to latitude 45°. The headwaters of the southern rivers of James' Bay are not far to the north of Lake Huron; while one of the branches of the Albany rises within 25 miles of the north shore of Lake Superior. Including the Winnipeg system, the basin of Hudson's Bay has a width of about 2100 miles from east to west, and a length of about 1500 miles from north to south, and its dimensions approach the enormous area of 3,000,000 square miles." * * * "Both the bay and strait are remarkably free from rock and shoals which might interfere with their free navigation."

Churchill Harbor on the west side can be entered by vessels of the largest size, and is thought likely to be the future shipping port for the agricultural and mineral products of the vast Northwest Territory. The shortest route between this territory and

England is through Hudson's Bay. Even the city of Winnipeg, near the southeastern extremity, is at least 800 miles nearer to Liverpool by the Hudson's Bay route than by the St. Lawrence.

As regards the difficulties caused by ice, Dr. Bell believes that the strait and bay may be navigated and the land approached by steamer during an average of four and a-half months each year, or from the middle of June to the end of October. The bay itself and probably the straits are open all the year round—it is only the harbors that are closed.

MICROSCOPY.¹

AMERICAN SOCIETY OF MICROSCOPISTS.—The executive committee of this society has decided to accept the invitation of the Elmira Microscopical Society, and to convene the next annual meeting of the society at that city, Elmira, N. Y., on Tuesday, Aug. 17, 1882, at 10 A. M. It is expected that the meetings will occupy four days, the final adjournment occurring Friday evening or Saturday morning, leaving ample time for those who wish to attend the Montreal meeting of the A. A. A. S. to reach Montreal by Tuesday, Aug. 24th. Many important papers have already been promised, and there is every reason to believe that the attendance will be large and the proceedings important. The local society at Elmira has taken up the work of preparing for the reception and entertainment of the society, with great enthusiasm, and will doubtless carry it out with marked success.

The committee appointed to consider and report upon the possibility of securing greater uniformity in the sizes of oculars produced by different makers, and some definite and uniform nomenclature in regard to their amplifying powers, has issued a circular to all manufacturers in this country asking information and co-operation. In the interest of the future convenience and satisfaction of all parties concerned, it is hoped that makers and dealers will cordially unite with the society in attempting by all reasonable means to secure so desirable an object. Those makers who may have failed to receive the circular can obtain copies from any member of the committee which consists of the following Ex-Presidents and present President of the Society: R. H. Ward, Troy, N. Y., H. L. Smith, Geneva, N. Y., J. D. Hyatt, Morrisana, N. Y., Geo. E. Blackham, Dunkirk, N. Y.

The Griffith prize, consisting of a Bausch and Lomb $\frac{1}{2}$ inch objective of 98° air angle (0.76 numerical aperture) is to be awarded at this meeting to the author of the best paper presented on the adulteration of some important article of food or medicine. Papers are to be accompanied by permanently mounted slides illustrating the points under discussion. Names of competitors are to remain unknown until after the announcement of the

¹ This department is edited by Dr. R. H. WARD, Troy, N. Y.